

ABBREVIATIONS

A/E	ARCHITECT / ENGINEER
AHX	AIR TO AIR HEAT EXCHANGER
AB	AIR BLENDER
AAV	AUTOMATIC AIR VENT
ACC	AIR COOLED CONDENSER
ACCHAIR	COOLED CHILLER
ACCU	AIR-COOLED CONDENSING UNIT
ACU	AIR CONDITIONING UNIT
ACD	AUTOMATIC CONTROL
ACD-TP	DAMPER/MODULATING DAMPER TWO POSITION
AD	ACCESS DOOR
AF	AFTER FILTER
AFCV	AIR FLOW CONTROL VALVE
AFF	ABOVE FINISHED FLOOR
AFMD	AIR FLOW MEASURING DEVICE
AFW	AIR FOIL WHEEL (FAN)
AHU	AIR HANDLING UNIT
AMP	AMPERE
AP	ACCESS PANEL
APD	AIR PRESSURE DROP
ARI	AIR CONDITIONING AND REFRIGERATION INSTITUTE
AS	AIR SEPARATOR
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS
AW	AIR WASHER
AXF	AXIAL FLOW
B	BOILER
BD	BUTTERFLY DAMPER
BDD	BACKDRIFT DAMPER
BDR	BASE BOARD RADIATOR
BFP	BACKFLOW PREVENTER
BFT	BOILER PLANT FIRE TUBE
BG	BOTTOM GRILLE
BHP	BRAKE HORSEPOWER
BHW	HOT WATER HEATING BOILER
BHX	BOILER BLOWDOWN HEAT EXCHANGER
BIW	BACKWARD INCLINED WHEEL (FAN)
BMT	BONE MARROW TRANSPLANT
BR	RELIEF AIR DAMPER
BSC	BIOLOGICAL SAFETY CABINETS
BT	BLOWOFF TANK
BTC	BLOWOFF TANK CONTROL VALVE
BTU	BRITISH THERMAL UNIT
BTUH	BRITISH THERMAL UNIT PER HOUR
BWT	BOILER PLANT WATER TUBE
C	CENTIGRADE (CELSIUS)
CC	COOLING COIL
CCD	COOLING COIL CONDENSATE DRAIN
CD	CEILING DIFFUSER
CD-1	CONSTRUCTION DOCUMENTS (SUBMISSION1)

CD-2	CONSTRUCTION DOCUMENTS (SUBMISSION2)
CENT	CENTRIFUGAL
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CFT	CUBIC FEET
CC	CUBIC FEET
CG	CEILING GRILLE
CH	CHILLER
CHP	CHILLED WATER PUMP
CHR	CHILLED WATER RETURN
CH	CHILLED WATER SUPPLY
CHW	CHILLED/HOT WATER SUPPLY
CHWR	CHILLED/HOT WATER RETURN
CI	CAST IRON
CM	CARBON MONOXIDE
CM	CUBIC METER
CM/S	CUBIC METER PER SECOND
CO	CLEAN OUT
CO2	CARBON DIOXIDE
COMP	COMPRESSOR UNIT
COP	COEFFICIENT OF PERFORMANCE
CP	CONDENSATE PUMP
CR	CEILING REGISTER
CSG	CONDENSATE STORAGE TANK
CS	CLEAN STEAM GENERATOR
CT	COOLING TOWER
CU	CONDENSING UNIT
CUH	CABINET UNIT HEATER
CV	CONSTANT VOLUME
CW	COLD WATER (POTABLE)
CWCC	CHILLED WATER COOLING COIL
CWP	CONDENSER WATER PUMP
CWR	CONDENSER WATER RETURN
CWS	CONDENSER WATER SUPPLY (FROM COOLING TOWER)
D	DAMPER - AUTOMATIC
D-1	OUTDOOR AIR DAMPER
D-2	RETURN AIR DAMPER
D-3	RELIEF AIR DAMPER
DB	DECIBELS
DD-1	DESIGN DEVELOPMENT (SUBMISSION1)
DD-2	DESIGN DEVELOPMENT (SUBMISSION2)
DDC	DIRECT DIGITAL CONTROLS
DEG	DEGREE
DF	DIFFUSER
DIA	DIAMETER
DW	DEIONIZED WATER
DP	DEW POINT TEMPERATURE
DP	DIFFUSER PLATE
DPA	DIFFERENTIAL PRESSURE ASSEMBLY
DPS	DIFFERENTIAL PRESSURE SENSOR
DX	DIRECT EXPANSION
DXCC	DIRECT EXPANSION COOLING COIL

ABBREVIATIONS

EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EC	EVAPORATIVE COOLER
ECC	ENGINEERING CONTROL CENTER
ECU	EVAPORATIVE CONDENSER UNIT
EDH	ELECTRIC DUCT HEATER
EER	ENERGY EFFICIENCY RATIO
EF	EXHAUST FAN
EG	EXHAUST GRILLE
ECS	EMERGENCY GAS SHUTOFF
EGT	ENTERING GLYCOL TEMPERATURE
EH	EXHAUST HOOD
EJ	EXPANSION JOINT
EMD	END OF MAIN DRIP (STEAM)
ENT	ENTERING
EX	EXISTING
F	FLOATH/HEIT
F&T	FLOAT AND THERMOSTATIC
F/SDPR	COMBINATION FIRE SMOKE DAMPER
FA	FREE AREA
FC	FLEXIBLE CONNECTION
FCU	FAN COIL UNIT (4 PIPE)
FCUC	FAN COIL UNIT COOLING ONLY
FCUH	FAN COIL UNIT HEATING ONLY
FCW	FORWARD CURVED WHEEL (FAN)
FD	FLOOR DRAIN
FD	FIRE DAMPER
FF	FINAL FILTER
FFX	FLUE GAS/FEEDWATER HEAT EXCHANGER
FM	FLOW METER
FOP	FUEL OIL PUMP
FOT	FUEL OIL TANK
FOXH	FUEL OIL HEAT EXCHANGER
FP	FEET PER MINUTE
FP	FEET PER SECOND
FPTU	FAN POWERED TERMINAL UNIT
FR	FLOOR REGISTER
FRP	FIBER REINFORCED POLYESTER
FS	FLOW SWITCH
FSAT	FREEZE/STAT

FT	FEET
FT-LB	FOOT-POUND
FTR	FIN TUBE RADIATION
FV	FACE VELOCITY
GA	GAUGE
GAL	GALLONS
GH	GRAVITY HOOD
GPD	GALLONS PER DAY
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GPR	GAS PRESSURE REGULATOR
GS	GALVANIZED STEEL
H	HUMIDIFIER
H&CW	HOT & COLD WATER
HAC	HOUSEKEEPING AID CLOSET
HB	HOSE BIBB
HC	HEATING COIL
HD	HEAD
HD	HOOD
HOA	HAND/OFF/AUTOMATIC
HP	HEAT PUMP
HP	HORSEPOWER
HPDT	HIGH PRESSURE DRIP TRAP
HPDR	HIGH PRESSURE RETURN (STEAM CONDENSATE)
HPS	HIGH PRESSURE SUPPLY
HRC	HEAT RECOVERY COIL
HRD	HEAT RECOVERY DEVICE
HRP	HYDRONIC RADIANT (CEILING) PANEL
HRW	HEAT RECOVERY WHEEL
HSTAT	HUMIDISTAT
HTM	HUMIDIFIER TERMINAL
HUM	HUMIDIFIER UNIT MOUNTED
HVU	HEATING AND VENTILATING UNIT
HW	HOT WATER
HWC	HOT WATER HEATING COIL
HWH	HOT WATER HEATING PUMP
HWH	HEATING HOT WATER RETURN
HWH	HEATING HOT WATER SUPPLY
HWHU	HOT WATER UNIT HEATER
HVD	HOT/WAY VENT DAMPER
HV	HEAT EXCHANGER
HZ	HERTZ

ABBREVIATIONS

IBC	INTERNATIONAL BUILDING CODE
IMC	INTERNATIONAL MECHANICAL CODE
I/O	INPUT/OUTPUT
IAQ	INDOOR AIR QUALITY
IBT	INVERTED BUCKET TRAP
ICF	IN-LINE CENTRIFUGAL FAN
ICU	INTENSIVE CARE UNIT
ID	INSIDE DIAMETER
IFB	INTEGRAL FACE AND BYPASS
IN	INCHES
IN HG	INCHES OF MERCURY
IN WC	INCH WATER COLUMN
IN WG	INCH WATER GAUGE
IN-LB	INCH-POUND
IPLV	INTERGRADED PART LOAD VALUE
IR	INFRARED HEATER
IS	INSECT SCREEN
IU	INDUCTION UNIT
IV	INLET VANES
J	INTENTIONALLY LEFT BLANK
K	KILOGRAM
kg	KILOGRAM
kg/HR	KILOGRAM PER HOUR
kPa	KILOPASCAL
kW	KILOWATT
kWh	KILOWATT HOUR
L	LITER
L/h	LITERS PER HOUR (OR LITERS/HOUR)
L/m	LITERS PER MINUTE (OR LITERS/MINUTE)
L/s	LITERS PER SECOND (OR LITERS/SECOND)
LAT	LEAVING AIR TEMPERATURE
LBS/HR	POUNDS PER HOUR
LE	LINEAR FOOT (FEET)
LGT	LEAVING GLYCOL TEMPERATURE
LH	LATENT HEAT
LH	LIQUID TO LIQUID HEAT EXCHANGER
LPR	LOW PRESSURE RETURN (STEAM CONDENSATE)
LPRC	LOW PRESSURE STEAM RETURN (CLEAN)
LLHX	LIQUID TO LIQUID HEAT EXCHANGER
LPS	LOW PRESSURE STEAM
LPSC	LOW PRESSURE STEAM (CLEAN)
LSD	LIQUID SLOT DIFFUSER
LTPC	LOCAL TEMPERATURE CONTROL PANEL
LTV	LEAVING TOWER
LVR	LEAVING WATER TEMPERATURE

M	METER, SI UNIT
M/s	METERS PER SECOND (OR METERS/SECOND)
M	MIXED AIR
MAT	MAKE-UP AIR UNIT
MAU	MAKE-UP AIR UNIT
MAV	MANUAL AIR VENT
MAX	MAXIMUM
MB	MIXING BOX
MBH	1000 BTUH
MCA	MINIMUM BRANCH CIRCUIT AMPACITY
MER	MECHANICAL EQUIPMENT ROOM
MERV	MINIMUM EFFICIENCY REPORTING VALUE
MH	MANHOLE
MHP	MOTOR HORSEPOWER
MIN	MINIMUM
MM	MILLIMETER
MOV	MOTOR OPERATED VALVE
MPR	MEDIUM PRESSURE RETURN (STEAM CONDENSATE)
MPS	MEDIUM PRESSURE STEAM
MRI	MAGNETIC RESONANCE IMAGING
MTD	MEAN TEMPERATURE DIFFERENCE
MVD	MANUAL VOLUME DAMPER
MZ	MULTI-ZONE
NA	NOT APPLICABLE
NC	NOISE CRITERIA
NC	NORMALLY CLOSED
NGM	NATURAL GAS FLOWMETER
NO	NORMALLY OPEN
NOAA	NATIONAL OCEANIC & ATMOSPHERIC ADMINISTRATION
NOM	NOMINAL
NPLV	NET POSITIVE LIQUID HEAD
NPSH	NET POSITIVE SUCTION HEAD
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OAG	OUTSIDE AIR GRILLE
OAI	OUTSIDE AIR INTAKE
OD	OUTSIDE DIAMETER
OFM	OIL FLOWMETER
OR	OPERATING ROOM

ABBREVIATIONS

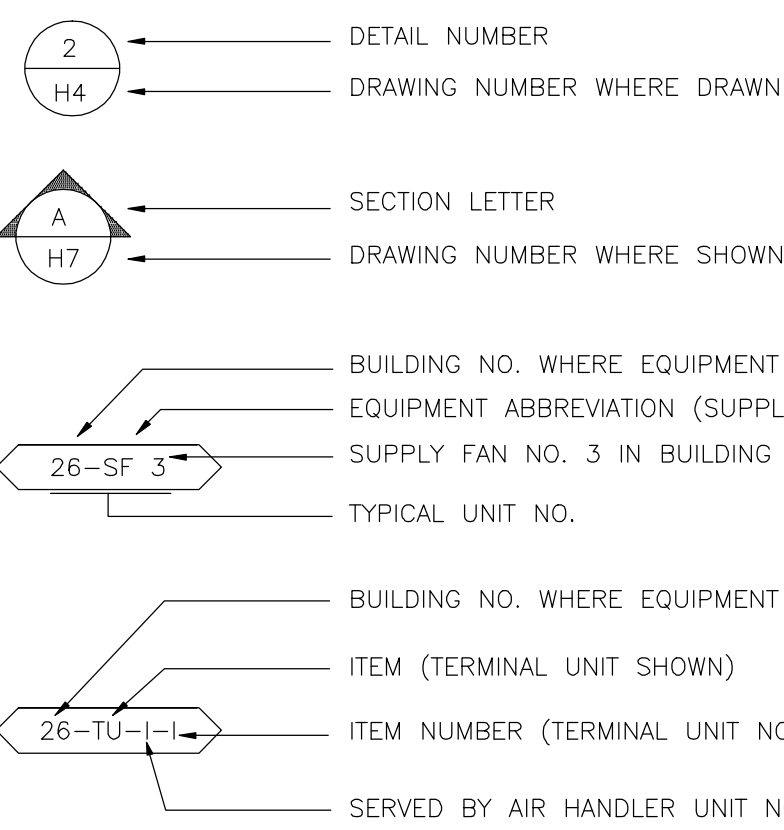
P	PUMP
PA	PASCAL
PC	PUMPED CONDENSATE
PCF	POUNDS PER CUBIC FOOT (FEET)
PD	PRESSURE DROP
PEF	PROPELLER (TYPE) EXHAUST FAN
PF	PRE-FILTER
PG	PRESSURE GAGE
PW	PROPYLENE GLYCOL-WATER (SOLUTION)
PHC	PREHEAT COIL
PPM	PARTS PER MILLION
PRS	PRESSURE REGULATING (VALVE) STATION
PRV	PRESSURE REGULATING VALVE
PSI	POUNDS PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH - ABSOLUTE
PSIG	POUNDS PER SQUARE INCH - GAGE
PSS	PRIMARY SECONDARY SYSTEM
PSV	PRESSURE SAFETY VALVE
PTAC	PACKAGED TERMINAL AIR CONDITIONER
R/E	RETURN OR EXHAUST
RA	RETURN AIR
RAO	REFRIGERANT AIR DRYER
RAF	RADIO FREQUENCY
RAHX	ROTARY AIR HEAT EXCHANGER
RAT	RETURN AIR TEMPERATURE
RCCH	REMOTE CONDENSER CHILLER
RCU	RECIPROCATING CHILLER UNIT
R	REFRIGERANT DISCHARGE
RDS	ROOM DATA SHEETS
REA	RELIEF AIR
RF	RETURN FAN
RG	RETURN GRILLE
RH	RELATIVE HUMIDITY
RHC	REHEAT COIL
RHG	REFRIGERANT HOT GAS
RL	REFRIGERANT LIQUID LINE
RLA	RUN LOAD AMPERE
RO	REVERSE OSMOSIS
RP	REVOLUTIONS PER MINUTE
RR	RETURN REGISTER
RS	REFRIGERANT SUCTION
RTU	ROOF TOP UNIT
RV	RELIEF VALVE

ABBREVIATIONS

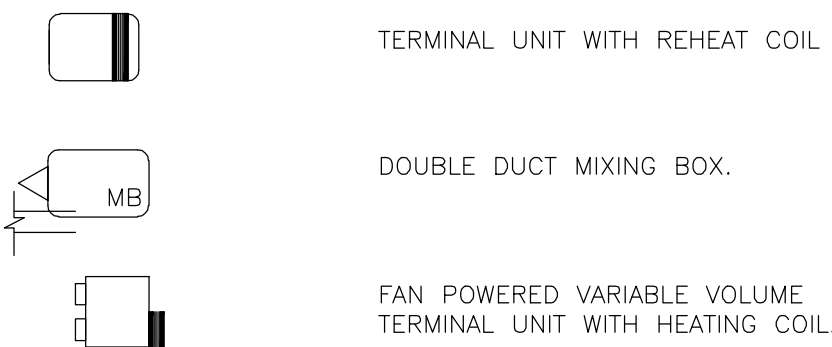
SA	SUPPLY AIR
SAD	SOUND ATTENUATING DEVICE
SAT	SUPPLY AIR TEMPERATURE
SC	SHADING COEFFICIENT
SCFM	STANDARD CUBIC FEET PER MINUTE
SCI	SERIAL CODE INQUIRY
SCR	SILICON CONTROLLED RECTIFIER
SD	SMOKE DETECTOR
SD	SUPPLY AIR DIFFUSER
SD-1	SCHEMATIC DESIGN (SUBMISSION1)
SD-2	SCHEMATIC DESIGN (SUBMISSION2)
SDPR	SMOKE DAMPER
SDR	SMOKE DAMPER (RETURN)
SDS	SMOKE DAMPER (SUPPLY)
SEN	SENSIBLE HEAT
SF	SUPPLY FAN
SG	SUPPLY AIR GRILLE
SH	STEAM HUMIDIFIER
SHC	STEAM HEATING COIL
SI	SQUARE INCHES
SP	STATIC PRESSURE
SP GR	SPECIFIC GRAVITY
SPD	SUPPLY PROCESS AND DISTRIBUTION
SPRV	STEAM PRESSURE REDUCING VALVE
SPS	STATIC PRESSURE SENSOR
SQ FT	SQUARE FOOT (FEET)
SR	SUPPLY AIR REGISTER
SS	STAINLESS STEEL
SSHX	STEAM TO STEAM HEAT EXCHANGER
SSR	SOLID SEPARATOR
ST	STEAM TRAP
ST	STEAM UNIT HEATER
SV	STEAM PRESSURE REDUCING VALVE
SVS	STEAM VENT SILENCER
SWHX	STEAM TO WATER HEAT EXCHANGER
T & PCV	TEMPERATURE AND PRESSURE CONTROL VALVE
TAB	TESTING, ADJUSTING, BALANCE
TD	TEMPERATURE DIFFERENCE
TDH	TOTAL DYNAMIC HEAD
TDS	TOTAL DISSOLVED SOLIDS
TS	TRANSFER GRILLE
TP	TRAP
TG	TURBINE
TSP	TOTAL STATIC PRESSURE
TSAT	THERMOSTAT
TU	THRU-WALL UNIT

UC	UNDER CUT
UC	UNIT COOLER
UH	UNIT HEATER
UL	UNDERWRITERS LABORATORY
URV	UPBLAST UNIT VENTILATOR
V	VALVE
VAF	VAINE-AXIAL FAN
VAV	VARIABLE AIR VOLUME
VD	VOLUME DAMPER (MANUAL OPPOSED BLADE)
VFD	VARIABLE FREQUENCY DRIVE
VHA	VETERANS HEALTH ADMINISTRATION
VI	VIBRATION ISOLATOR
VV	VARIABLE INLET VANES
VP	VACUUM PUMP
VPS	VARIABLE PRIMARY SYSTEM
VR	VACUUM (STEAM CONDENSATE) RETURN
VSD	VARIABLE SPEED DRIVE
VUH	VERTICAL UNIT HEATER
W	WATTS
WAG	WASTE ANESTHESIA GAS
WB	WET-BULB (TEMPERATURE)
WC	WATER COOLED
WCH	WATER COOLED CHILLER
WCCU	WATER COOLED CONDENSING UNIT
WCHP	WATER COOLED HEAT PUMPS
WCU	WATER COOLED PACKAGED UNIT
WEF	WALL EXHAUST FAN
WF	WATER FILTER
WFCV	WATER FLOW CONTROL VALVE
WFM	WATER FLOWMETER
WMD	WATER FLOW MEASURING DEVICE
WG	WATER GAGE
WPD	WATER SIDE PRESSURE DROP
YR	YEAR

DRAWING SYMBOLS



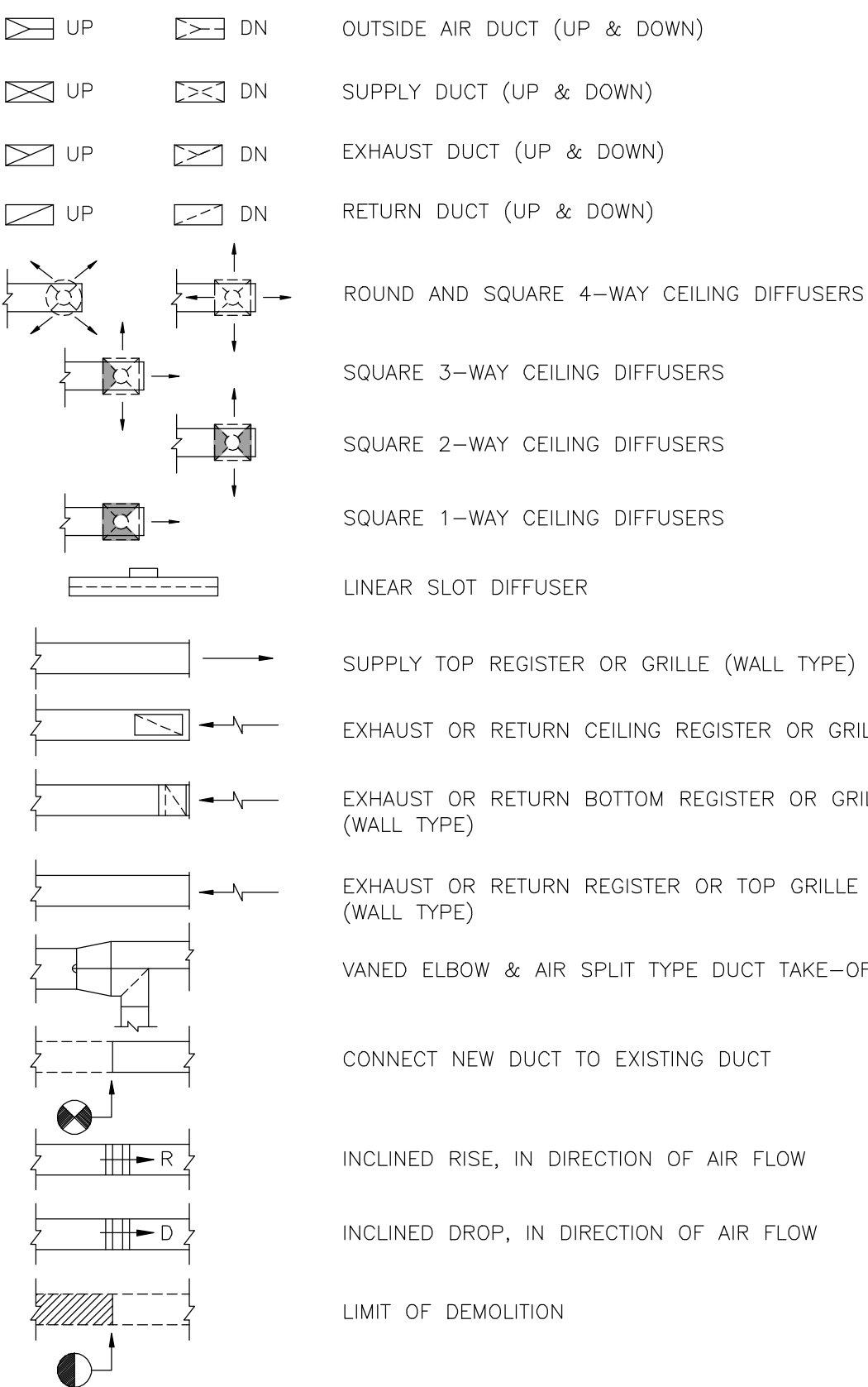
AIR TERMINAL SYMBOLS



GENERAL NOTES

1. ALL PIPING AND DUCTS IN FINISHED ROOMS OR SPACES SHALL BE CONCEALED IN A FURRED CHASE OR ABOVE THE SUSPENDED CEILING.
2. THE FIRST FIGURE OF DUCT SIZE INDICATES DIMENSION OF FACE SHOWN OR INDICATED. DUCT SIZES ARE NET INSIDE DIMENSIONS.
3. ACCESS PANELS IN HARD SUSPENDED CEILINGS ARE REQUIRED FOR ALL VALVES, TRAPS, DAMPERS, CLEANOUTS, CONTROLS, ETC. ACCESS PANELS SHALL BE FURNISHED AND INSTALLED UNDER THE ARCHITECTURAL SPECIFICATIONS.
4. TOTAL STATIC PRESSURE NOTED IN THE SCHEDULES INCLUDES DUCT SYSTEM, TERMINAL UNITS, FILTERS, COILS, ETC.
5. DIFFUSER, REGISTER AND GRILLE SIZES SHOWN ON FLOOR PLANS ARE NECK SIZES.
6. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATIONS OF CEILING DIFFUSERS, REGISTERS, AND GRILLES.
7. SEISMIC PROVISIONS REQUIRED - SEE SPEC. SECT. 13 05 41, 23 05 11 AND 23 05 41. ALL PRESSURES LISTED ARE GAGE PRESSURE UNLESS OTHERWISE NOTED.
8. ALL ITEMS THAT REQUIRE ACCESS, SUCH AS OPERATING, CLEANING, SERVICING, MAINTENANCE, AND CALIBRATION, SHALL BE EASILY AND SAFELY ACCESSIBLE BY PERSONS STANDING AT FLOOR LEVEL, OR STANDING ON PERMANENT PLATFORMS, WITHOUT THE USE OF PORTABLE LADDERS. EXAMPLES OF THESE ITEMS INCLUDE, BUT ARE NOT LIMITED TO: ALL TYPES OF VALVES, FILTERS AND STRAINERS, TRANSMITTERS, CONTROL DEVICES.

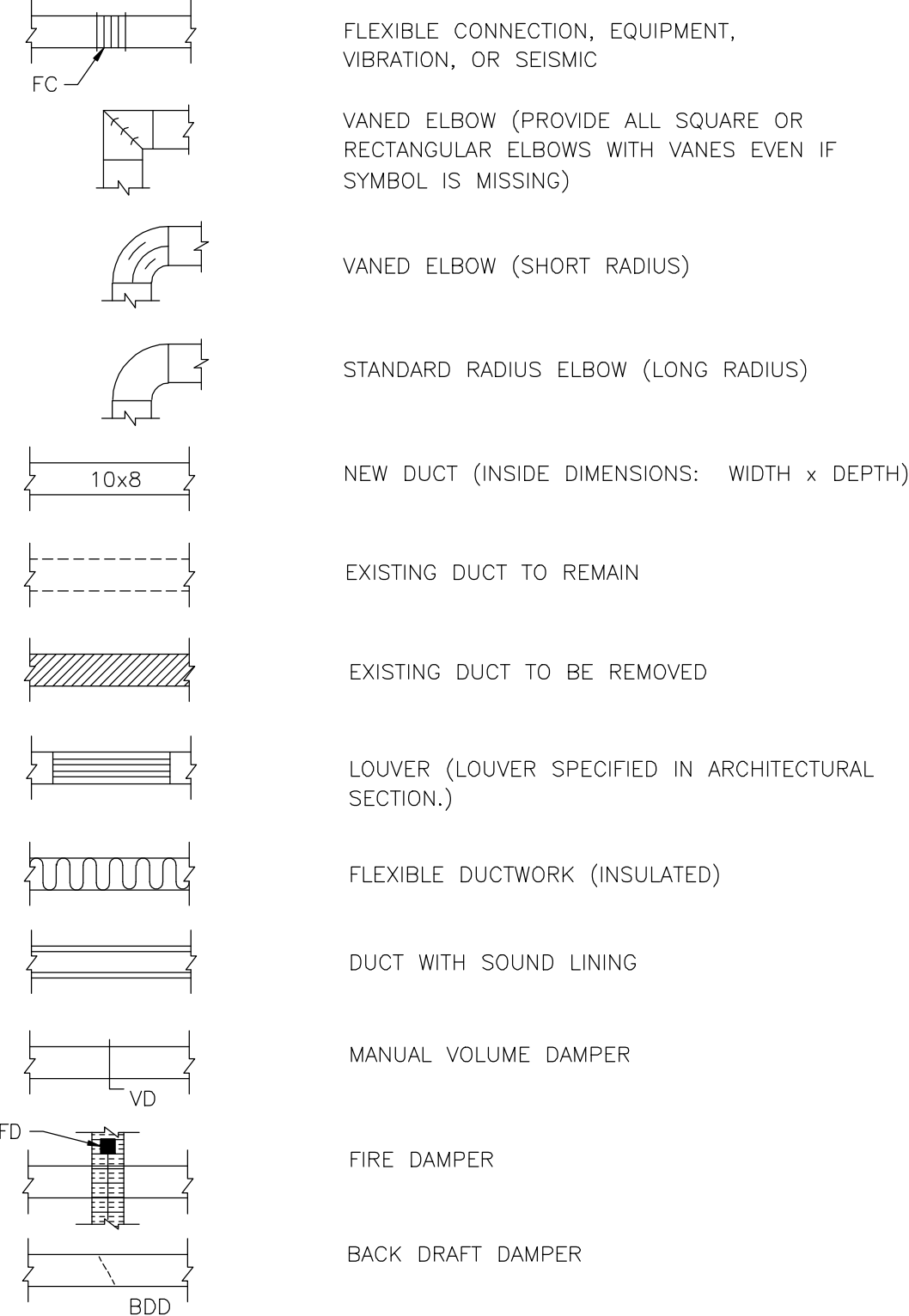
DUCTWORK SYMBOLS



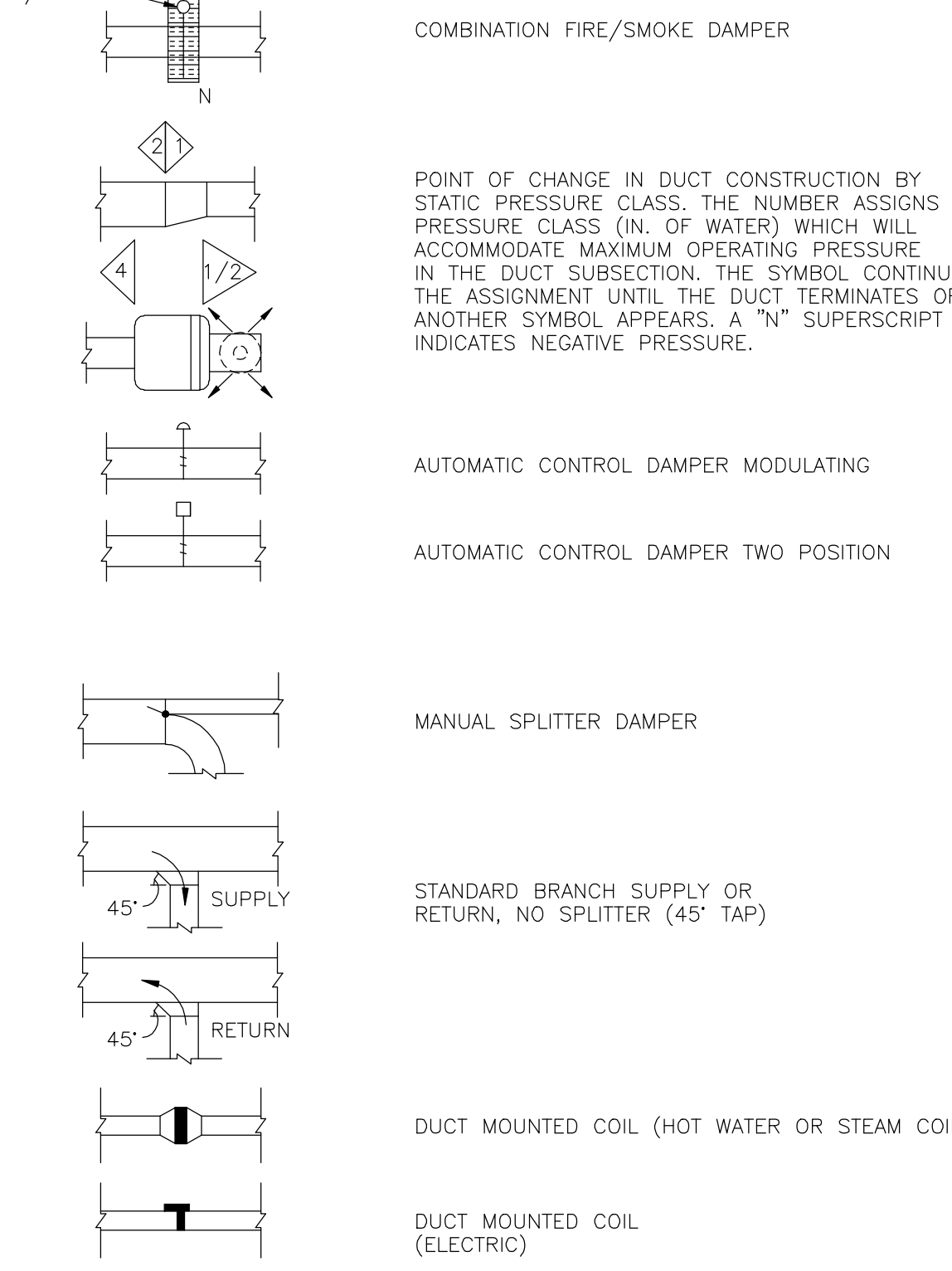
LEED NOTES

1. EAq1 - CONTRACTOR SHALL SUBMIT ALL O & M MANUALS AT START OF JOB FOR COMMISSIONING AGENT TO PROVIDE TESTING REPORTS. CONTRACTOR WILL BE REQUIRED TO WORK WITH COMMISSIONING AGENT TO TEST ALL EQUIPMENT.
2. EAq2 & EAq1: EFFICIENCIES LISTED ON SCHEDULES OF ALL HVAC EQUIPMENT SHALL BE MINIMUM.
3. EAq3: REFRIGERANT LISTED ON SCHEDULE IS REQUIRED, NO SUBSTITUTION.
4. IEQp1 & IEQq3: ALL EXHAUST AND PLUMBING VENTS SHALL BE MINIMUM DISTANCE (AS NOTED ON PLANS) FROM ALL OUTSIDE AIR INTAKES. CONTRACTOR SHALL PROVIDE 14 DAY FLUSH-OUT PERIOD FOR ALL BUILDINGS AFTER CONSTRUCTION IS COMPLETE. AFTER FLUSH-OUT, REPLACE ALL FILTERS WITH MERV 13 FILTERS SPECIFIED.
5. IEQq1: PROVIDE CO2 SENSORS TO MONITOR CO2 LEVELS FOR SPACES WITH OCCUPANCY DENSITY OF 25 PEOPLE PER 1000 OR MORE. SEND ALARM IF MORE THAN 125 OVER THE 1000 PPM SET POINT.
6. IEQq2: PROVIDE INDIVIDUAL COMFORT CONTROLS FOR A MINIMUM OF 50% OF OCCUPANTS.
7. IEQq7: THE HVAC DESIGN COMPLIES WITH ASHRAE STANDARD 55-2004 THERMAL COMFORT. COMMISSIONING AGENT TO PROVIDE THERMAL COMFORT SURVEY AND AGREE TO PROVIDE CORRECTIVE PLAN IF MORE THAN 20% OF OCCUPANTS ARE DISSATISFIED.

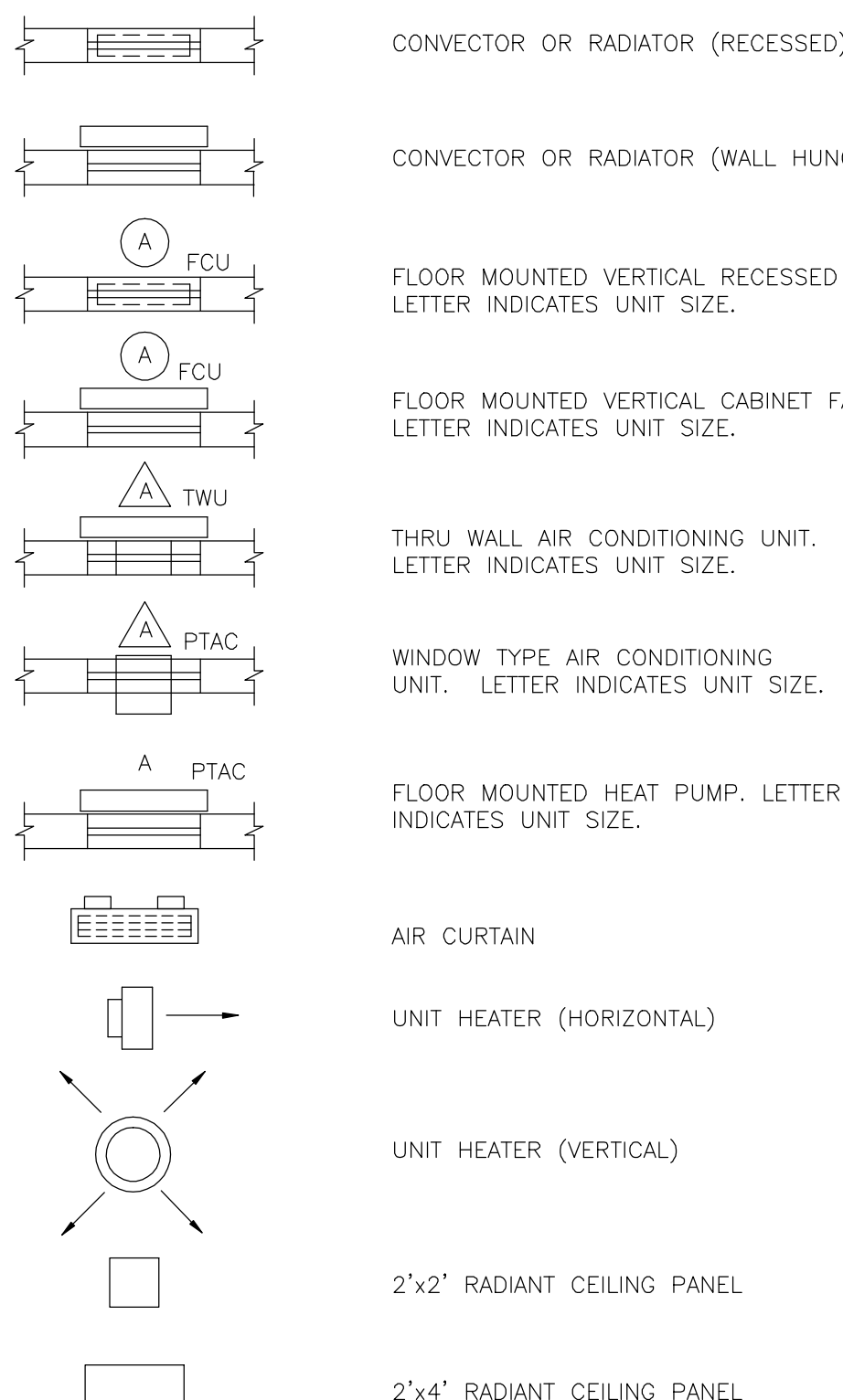
DUCTWORK SYMBOLS



DUCTWORK SYMBOLS



TERMINAL UNIT SYMBOLS



GENERAL SYMBOLS

